DOCUMENT RESUME

ED 325 388 SE 051 728

AUTHOR Syster, Susan M.
TITLE Developing a Publication Containing Elementary Teachers' Successful Mathematics Instruction Strategies.
PUB DATE Mar 87
NOTE 59p.; Education Specialist Practicum, Nova University.
PUB TYPE Dissertations/Theses - Practicum Papers (043)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Arithmetic; Curriculum Guides; Educational Improvement; Elementary Education; *Elementary School Science; *Mathematics Instruction; *Newsletters; *Publications; School Effectiveness; *Staff Development; Surveys; Teacher Administrator Relationship; Teacher Burnout; Teacher Motivation; Teaching Methods

ABSTRACT

Mathematics teachers are trained to assess students' abilities and instruction needs. Many teachers use creative teaching strategies, games, and various media to meet those needs. Teachers, though, are constantly searching for instructional strategies, time savers, games, materials, and other ways to improve teaching in mathematics classrooms. Since they have such busy schedules and lack the time to get together with fellow teachers to share ideas and visit each others' classrooms, a mathematics publication was developed to address these needs. The publication was written by and for teachers. Mathematics teachers shared ideas with other teachers in the district in articles which were published in the issue. A target group was pre-surveyed before the publication and post-surveyed after the publication was distributed. The knowledge and usefulness expressed by the target group indicated the desire for future issues of the publication within the school district. Included in this report are the purpose of this project, a brief literature review, a description of the project methods, results of the project, and recommendations. Copies of memos, surveys, and letters are appended. (Author/CW)

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ED325388

DEVELOPING A PUBLICATION CONTAINING ELEMENTARY TEACHERS' SUCCESSFUL MATHEMATICS INSTRUCTION STRATEGIES

by

SUSAN M. SYSTER

A Practicum Report
submitted to the Faculty of the Center for the Advancement of Education of Nova University in partial fulfillment of the requirements for the degree of Educational Specialist.

The abstract of this report may be placed in the School Practices Information Files for reference.

March/1987

Running Head: DEVELOPING A PUBLICATION

SE051728

I hereby testify that this paper and the work it reports are entirely my own. Where it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other workers in the field and in the hope that my own work, presented here, will earn similar respect.

Susan Marie Syster

Susan Marie Syster

ABSTRACT

Syster, S.M., (1987). Developing a publication containing elementary teachers' successful mathematics instruction strategies. Practicum Report, Nova University, Center for the Advancement of Education, Tampa, FL.
Descriptors: Elementary School Mathematics/ Arithmetic/ Elementary Education/ Teaching Methods/ Curriculum Guides/ Newsletters/ Educational Improvement/ Teacher Burnout/ Staff Development/ Teacher Administrator Relationship/ Teacher Motivation/ School Effectiveness.

Mathematics teachers are trained to assess students' abilities and instruction needs. Many teachers utilize creative teaching strategies, games, and various media to meet those needs. Teachers, though, are constantly searching for new skill instruction strategies, time savers, games, materials, and other ways to improve teaching in mathematics classrooms. Since they have such busy schedules and lack the time to get together with fellow teachers to share ideas and visit each others' classrooms, a mathematics publication (to be distributed district-wide) was developed to address these needs. The publication was written by and for teachers. Mathematics teachers shared ideas with other teachers in the district in articles which were published in the issue. A target group was pre-surveyed before the publication and post-surveyed after the publication was distributed. The knowledge and usefulness expressed by the target group indicated the desire for future issues in the district.

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Practicum Title Developing a Publication Containing Elementary Teachers' Successful Mathematics Instruction Strategies

Student's Name Susan M. Syster

Program Site Tampa, Florida Date March 30, 1987

Observer's Name Sally McCrimmon
(please print and sign)

Observer's position Supervisor - Elementary Mathematics

Observer's comment on impact of the project handwritten.

Continued success has been attributed to the "publishable" as evidenced by teachers' requests for copies of articles from these writers. Many elementary mathematics [illegible] have received "kudos" for publishing their techniques. This was accomplished through the dynamic enthusiastic leadership

CHAPTER I

PURPOSE

This practicum was implemented and tested in a school district which contains 72 elementary schools, 21 middle schools, and 14 high schools. The district was ranked as the 21st largest school system in the nation in 1986. The enrollment is approximately 36,000 at the elementary schools. The student population is very mobile. Students move in and out from various states or from different schools in the county frequently. The district's teachers originally came from various areas of the United States, particularly the Northeast, and possess diverse teaching methods and expertise from different school systems and teacher training institutions.

The writer is a reading and language arts specialist who performs various duties at her elementary school. One of her major duties is that of providing staff development in the reading and language arts program to teachers in her school. Reading and language arts specialists have a masters degree in reading education. A new reading and language arts program was implemented in the district last year. Each elementary school has a reading and language arts specialist who schedules monthly school-based training sessions to provide teachers with inservice on the new

methods and materials required. Teachers must attend these meetings.

The writer is also a staff member of a district-wide committee which writes a publication by and for reading and language arts teachers. The publication, Rainbow Reflections, (Henning, 1983), gives recognition to many of the school district's elementary teachers by providing a means to share creative teaching ideas, helpful hints, and time savers in reading classrooms. Many of these ideas have been used by the district's teachers to enhance the new reading and language arts program. At one school a mathematics teacher procured a copy of each new issue last year so that she could try to adapt some of the reading ideas in her mathematics classroom. This action exemplifies the popularity of the reading publication.

Many teachers have utilized this publication, which has been published for 10 years, and realize its many benefits. Teachers are thankful when their ideas are published. This is evidenced by the many thank-you notes written to the writer and other staff members from teachers who have been recognized in the publication. It is apparent that both the giver and the receiver are motivated from this publication.

The role of the reading and language arts specialist in the elementary schools in this district had been expanded to

include being the designated implementor for the new mathematics program. This is true only where there is no assistant principal, such as in the case of the writer. Elementary schools with an assistant principal assign that person as the designated implementor. Approximately half of the elementary schools in this district have assistant principals. 40 out of 72 do not.

Consequently, the role of the writer had been expanded to provide training in the new mathematics program to teachers at her school as well as to continue reading and language arts program training. Monthly mathematics meetings were held to accomplish this training for the teachers in the school. These were scheduled after district meetings were attended by the assistant principals and reading specialists who were the designated implementors. At these district training meetings it had been discussed that teachers were asking on-going similar types of questions. The writer felt that this was due to the newness of the program.

The mathematics program involves using district-developed resource kits in conjunction with a new textbook series. There are approximately 1,700 mathematics teachers in the 72 elementary schools in the district all using the same new mathematics program.

Informal interviews (taken at the end of the 1985 - 1986

school year with mathematics teachers and the principal at the writer's school) revealed the desire of many of the teachers for a publication to share ideas with other mathematics teachers in this district (similar to the reading publication). Since 19 of the 22 teachers in the writer's school were self-contained (teach all subjects) they had received each issue of the district's reading publication. Many had utilized the various teacher-written suggestions throughout the years in these issues. Several of these same teachers had had their creative reading ideas published and had expressed that they enjoyed receiving the publication. Many felt that since they had such busy schedules and lacked the time to get together with fellow teachers to share ideas or visit each others' classrooms, this was the "next best thing."

What works for other teachers exemplifies the credibility of the reading manual. Teachers respect each other's ideas because they know that many of their colleagues are experiencing the same types of classroom problems. Last year, during the implementation of the new reading and language arts program, they learned (often through the reading teachers' articles in the reading publication) how colleagues in other district schools were handling problems concerning each component of the new program. Many questions that teachers had concerning the new program were answered in the reading

publication by other teachers in other parts of this large school district. What worked in one classroom or school could also work in another, it was discovered.

One mathematics supervisor, who was informally interviewed by the writer, related that a mathematics publication was attempted, though unsuccessfully, in the past. A lack of articles was the reason it failed. This supervisor suspects that teachers did not turn in sufficient numbers of articles because of a lack of committee organization and a lack of monthly district training meetings where designated implementors could recruit each other to bring ideas from teachers in their schools and to share problems and questions from their schools.

The main problem was the lack of a way for teachers to share creative mathematics teaching ideas to help fellow teachers in the district. Staff development was on-going (at monthly school-based meetings), but a publication to communicate creative teachers' natural development of strategies that work was perhaps the "shot in the arm" needed to motivate mundane teachers who had become set in their ways. With 72 elementary schools in the district, why not share ideas so that each school wouldn't have to develop its own solutions? Since the district is using the same mathematics system - the same shortcuts, hints, and ideas could be beneficial to teachers in the entire district. The teachers desired a

mathematics publication to share ideas in the mathematics curriculum just as they already had for the reading and language arts curriculum. This need was expressed when the new mathematics program was introduced. Teachers were receptive to creating a publication for mathematics as learned through informal interviews.

Four elementary schools in the district were the primary target group for this practicum. Teachers of mathematics in these four schools were given a pre-survey. Results of this pre-survey indicated that teachers were excited about sharing ideas with colleagues in a publication and felt that such a manual would be extremely useful if used district-wide.

Teachers also indicated on the pre-survey a need for further training in the new mathematics program. All new materials were presented to them at one time and many teachers felt that they were not yet able to utilize these new materials to their fullest potential. Many teachers indicated on the pre-surveys that school-based training meetings should be continued. Other designated implementors agreed that teachers in their schools also felt that continued training was needed. The publication would provide answers to questions not answered in school-based meetings.

According to Ellis (1984), inservice education, formal or informal, promotes sharing of ideas and interdependence

among teachers. In form, it can be as simple as sharing resources or providing opportunities for conversation among teachers on professional concerns, or as formal as workshops and seminars, depending on available resources. The payoff is both improved instructional techniques and enhancement of professional self-awareness among teachers.

Iacocca (1984) believes the following pertaining to communicating with fellow workers:

> The best way to develop ideas is through interacting with your fellow managers. This brings us back to the importance of teamwork and interpersonal skills. The chemistry among two or three people sitting down together can be incredible - and it's been a big part of my own success.
>
> So I'm a great believer in having executives spend time together talking - not always in formal meetings, but simply shooting the breeze, helping each other out, and solving problems. (p. 63).

Teachers can't always get out to talk to colleagues in other schools, but they can write down what works for them so that these solutions can be shared with others. The main outcome objective of this practicum was the distribution of one issue of a mathematics publication by and for elementary

teachers. It was a communication vehicle for teachers that represented a condensed form of inservice. Teachers saw the value in the ideas presented and tried some of the new teaching strategies in their classrooms. The publication included a Question and Answer feature pertaining to the new mathematics program. This feature increased understanding of the new curriculum and enlightened teachers on utilization of new media and methods.

The writer felt that involving teachers in writing a publication containing their ideas to be shared with colleagues in this district would increase their feelings of self-respect and accomplishment. One Cornell graduate who came to teach in a high school English class in a rural mountain region in north Georgia found that his conventional teaching methods were not inspiring students. He realized that the textbooks and lectures were boring. The answer to handling the many disruptions was not to increase punishments and regulations. He learned a way to motivate students by using an alternative to the textbook. To inspire the class, he totally involved everyone in writing a magazine based on interviews and conversations with parents and grandparents about things such as superstitions, old home remedies, and weather signs. These magazine articles became the hugely successful Foxfire series. His students were learning because they were highly motivated.

Wigginton (1972), tells us that if someone says, "You've done well," we hunger to make that happen again and again. This is a normal need. It was hoped that a manual of local mathematics instructors' ideas would enable educators to realize that the recognition printed on the page was information worth repeating. The ideas would benefit both the givers and the receivers.

There were four outcome objectives of this practicum. They were:

1. A teacher or teachers from three out of the four target schools would turn in article ideas for the first issue of the mathematics publication so that teachers would have a vehicle for sharing creative ideas in the mathematics curriculum.

2. After receiving the publication, over 50% of the teachers in the four target schools would indicate that they used or planned to use some of the ideas published in the first issue this year.

3. Teachers in three out of the four schools in the target group would show an increased knowledge in the new mathematics program after reading the mathematics publication.

4. Teachers in three out of the four schools would indicate the desire to see another issue of the mathematics publication printed.

Post-surveys were given to the target group. Results of the post-surveys and also results of informal interviews with teachers were used to measure the outcomes.

CHAPTER II

RESEARCH AND SOLUTION STRATEGY

The district's reading and language arts publication is in its tenth year of printing. The authors (Henning et al., 1983), state that its popularity is tremendous. As a member on the writing committee for this publication, the writer has seen an increase each year in quality articles submitted by teachers. The committee tries to restrict each issue to twenty pages in length. Members feel that anything longer would be unwieldy for readers. Unpublished (extra) articles are saved for the following issue. Invariably, before finalizing each issue for printing, the committee must painstakingly choose pages to eliminate since there are always more than enough quality articles submitted. The publication is popular because in it teachers find useful ideas for their classrooms. These are ideas which are generated by successful teachers with students who are using them and learning from them.

The writer chose the strategy of developing a publication for mathematics teachers because of the tremendous response of teachers to Rainbow Reflections (Henning, et al., 1983), and because teachers felt the need to share creative mathematics ideas as well as reading ideas.

Although the literature did not provide a great deal on writing a publication, the writer used her knowledge gained

from working on the reading publication to do this. The huge success of the reading publication prompted the writer to look at creating a publication to fulfill the teachers' need to share and learn from their colleagues.

Most of the research used by the writer dealt with peer support, motivating teachers, and the use of media materials and manipulatives.

According to a study by Seidman (1985), teachers tend to use media materials less (or not at all) as burnout feelings increase. His findings indicate that the unwillingness to use media is both a symptom and a cause of burnout. He suggested that the employment of teachers of a variety of stimulating media programs and instructional strategies could help them overcome burnout and face their old jobs with renewed interest.

The writer did not intend to solve a burnout problem (if one existed), but, hoped that the recognition that teachers would receive from a mathematics publication would spark an interest in other teachers to contribute and would promote positive feelings. Learning, through a publication, about new media materials and instructional strategies that work with students, would also be of great benefit to readers. Although burnout is not addressed as a specific outcome objective, it could possibly be reduced as a result of the publication committee's efforts.

Burnout is characterized by a lack of enthusiasm and excitement by workers. Research shows that teachers who utilize various media in their teaching along with recognition by their superiors are less prone to burn out. Games, simulations, filmstrips, pictures, models, videotapes, and other media are more heavily utilized by motivated teachers. Motivated teachers also share teaching ideas with others, the writer feels, and they enjoy receiving ideas in return.

The writer suggested that a mathematics publication written by and for elementary teachers would give an alternative media resource in which educators could be recognized by peers.

Included in a list of "20 Suggestions for Motivating Teachers and Improving Morale," (DeRoche, 1985), are the following:

1. Provide teachers with the opportunity to share their expertise with one another. Use teacher talent to get things done.
2. Hold "rap sessions" with groups of teachers in an informal, relaxed setting.
3. Prepare news releases for local newspapers about some of the things specific teachers do that are worthy of note.
4. Get publicity for some or all of the school's programs.

Sayles and Strauss (1972), agreed that employees who are given a chance to express their ideas on how the job should be done, to display their creative talents, and to take pride in seeing their ideas accepted will have their morale raised.

Sergiovanni (1975), likewise found that teachers obtain their greatest satisfaction through the sense of achievement in reaching and affecting students, experiencing recognition, and feeling responsible.

An important finding in the research is that students should be provided with a variety of materials in addition to the textbook or workbook. One article, "An Administrator's Handbook," 1982, suggested the use of concrete materials, multi-media aids, fieldtrips, projects, and computing devices. There should be an increase in effective and efficient use of district resources, the article states. In addition, mathematics teachers at all levels must have an abundance of manipulative materials as well as access to calculators, computers, and stimulating instruction ideas. If various media were being used extensively, then the following description of mathematics classes would be outdated:

> In many schools, the elementary school child's math activity takes place 99 percent of the time in his workbook, completing worksheets. What experience

> there is with concrete materials is usually limited to the child's watching the teacher demonstrate something --- to the class. In the classrooms the primary 'activity' of the child is pushing a pencil or crayon over a page! The overwhelming emphasis on working with numbers can lead the child to believe that mathematics is learning to manipulate numbers. (Mathematics and Young Children, 1980).

Young children learn mathematics by physically manipulating objects, by abstracting concepts from those manipulations, and then by using symbols to represent those manipulations. The teacher of young children needs to create a rich environment (many opportunities for using manipulatives) and an atmosphere conducive to learning (activity centers, social interaction, and 'real life' mathematics teaching situations). Various methods and concrete materials are a necessity in classrooms so that teachers will expand students' mathematics skills.

Research cited unanimously agreed that a variety of teaching methods and materials are used by motivated teachers. These teachers would be the leaders in sharing successful ideas with others. Teachers need to share ideas and be recognized for their expertise.

A need was expressed to the writer for a mathematics

publication, similar to the popular reading manual, in this district because teachers are constantly searching for timesavers, skill teaching strategies that work, bulletin board ideas, games, new materials, and other ways to improve their teaching. For this practicum a mathematics publication of teachers' ideas was reproduced for all elementary mathematics teachers in the district to help to satisfy this need.

CHAPTER III

METHOD

The target group for the practicum was composed of 18 mathematics teachers in four elementary schools in a large Southeastern school district. The writer (after prior discussion and approval with the district's mathematics supervisors) distributed and compiled pre-surveys (See Appendix C) to teachers in the target group, compiled research materials, and recruited volunteers to work on a writing committee to help to develop the mathematics publication (See Appendix A).

The writer followed these steps to develop the mathematics publication:

1. Sent pre-surveys (Appendix C) to the four target schools. Designated implementors were in charge of distributing these to teachers in their schools and sending them back to the writer.

2. At a district mathematics training meeting the writer distributed the handout, "Let's Add Up" (Appendix A) to designated implementors. The writer spoke to the group to explain the need for a mathematics publication and the fact that volunteers were needed to help write it. The writer explained desirable

talents that committee members should possess. (It is helpful to have someone who is artistic on the committee). This initial contact was most important because it sparked interest in the entire idea. Volunteers may not always respond at first. If this happens, sometimes a word of support and encouragement from superiors (the principal or a mathematics supervisor) to a desirable candidate will be the necessary motivation.

3. There were six people who volunteered to be on the writing committee. These included three assistant principals, two reading and language arts specialists, one classroom teacher, and an elementary mathematics supervisor.

4. The writer compiled the pre-surveys which were returned from the target schools.

5. The handout, "FLASH" (Appendix B), was sent to each school in the district.

6. Teachers' instruction strategies and other article ideas were solicited by the writer and other designated implementors.

7. Article ideas were sent by interested teachers and designated implementors to committee members for publication consideration.

8. A planning meeting was held for the writing committee.

At this meeting the members brought and shared (read aloud) articles which teachers had sent to them. The committee listened to article ideas which were read and determined which ones should be published for the issue. At this meeting the committee also developed a title for the publication. They named the publication, Math Works. Decisions regarding the layout and features to include were made. Specific guidelines for writing articles were also produced. The committee agreed to use the following guidelines for articles:

a. Titles should be included.

b. Paragraphs should be indented.

c. Margins should be ½" on each side of the paper and on the top and bottom.

d. Illustrations or clip art should be utilized.

e. Hand printing, typing, or computer printing could be utilized for variety.

One person was assigned the task of creating a cover for the issue.

9. Members of the committee were given two weeks to produce and illustrate the articles which they were assigned to write. Members wrote these on their own time.

10. A second committee meeting was held approximately two weeks later. Members brought completed articles to be

proofread by co-workers. Spelling, typing, and punctuation corrections were made. Illustrations and titles were added if omitted. Borders were added for artistic enhancement. A large box of materials was brought by the supervisor for use by the committee. It included markers, white out, clip art books (pictures), scissors, spray mount, tape, rulers, glue sticks, and pencils. A xerox machine was available for enlarging or reducing articles. One committee member made a list of each person whose article would be published and the school that person was from. This list was given to the mathematics department's secretary who typed the teacher's name and the principal's name in the correct spaces on the recognition letters (Appendix E).

11. The issue of Math Works (Appendix G), was sent to the district's printing department. (The writer had received prior approval from the mathematics department to pay for printing costs.)

12. The mathematics department distributed an issue of Math Works to the following people in the district: the 1,850 mathematics teachers, principals, assistant principals, specialists, the superintendent, exceptional education teachers, school board members, supervisors of other disciplines, and one copy for each PTA.

13. A letter (Appendix E), and a sheet of bookmarks (Appendix F),were sent (the day after Math Works was distributed) to all principals whose teachers' articles had been published in the issue.

14. Post-surveys (Appendix D), were given to mathematics teachers in the four target schools after they were given time to read the issue and implement some of the suggestions. Post-surveys were sent approximately four weeks after the publication had been received. Designated implementors had informal discussions with teachers and observed in classrooms to evaluate the publication's impact.

15. Results of the post-surveys were compiled and evaluated so that they could be compared to results of the pre-surveys.

CHAPTER IV

RESULTS

Pre-surveys and post-surveys were administered to the target group (See Appendix C and Appendix D). The target group included 18 teachers from four elementary schools in the district. The pre-survey was written in two parts with a total of eight questions. In the pre-survey, questions #1 - #3 required respondents to fill in blanks. Questions #1 and #2 dealt with implementation of the new mathematics program. Question #3 dealt with the willingness of educators to share teaching ideas for a publication. Respondents were asked, in the remaining five questions, to rate the effectiveness of school-based inservice and the possible need for a way that teachers could share creative ideas in the mathematics curriculum. (A publication was suggested as the method to accomplish this, since that desire had been communicated by some teachers.)
These five questions (#4 - #8) were rated on a 5-point Likert-type scale.

The post-survey had a total of ten similar questions. It was administered after the target group had familiarized itself with the first issue of the mathematics publication. On the post-survey questions #1 - #5 were similar to the questions on the pre-survey. Questions #6 - #10 assessed

the usefulness of the ideas presented in the publication and the school-based inservice. Additional suggestions were elicited on this survey from teachers who desired additional issues of the mathematics publication.

Information from the pre-survey (questions #1 - #8) was compiled and compared with questions #1 - #9 on the post-survey.

For question #1 on the pre-survey and the post-survey there were identical results. Regarding whether or not teachers have unanswered questions about the new mathematics program, 44% of the respondents answered, "Yes," and 66% responded, "No." The writer feels that the publication will not eliminate questions about the new mathematics program. There will always be questions. What Math Works will do, the writer believes, is provide methods that successful teachers have developed to answer some of those questions for colleagues. The publication is another avenue to explain, solve problems, and provide fresh ideas and different approaches from those that may have been discussed at school-based inservice sessions.

One post-survey respondent who admitted having unanswered questions suggested in her response to question #1 that, "The new math program is following the new reading program too quickly - too much too soon."

Similarly, it was stated by another respondent that,

"The new program is excellent, but has too much new information and new implementation for me to do within one year. We need more time to read and understand the program before we are expected to teach it."

Another teacher wrote, "The planning is very difficult and time consuming."

"I think we need to slow down! Quality should be our main goal and things are going too fast," stated another teacher with a busy schedule.

The writer feels that perhaps the post-survey came too soon after the pre-survey for teachers to feel familiar with all aspects of the comprehensive new program that they were being asked to implement.

Another reason for negative feelings could have been the fact that teachers were receiving two major new program changes in two consecutive years (reading and language arts and mathematics.)

In question #2 on the pre-survey, suggestions were elicited to ensure proper implementation of the mathematics program. Teachers' suggestions included the following:

1. Get in teams at meetings to share ideas.

2. Continue school-based training.
3. Instruct teachers in the program.
4. More meetings to explain implementation.
5. Continue follow-up and feedback.
6. Inservice training once a month.
7. Sharing of ideas among teachers.
8. Follow schedule and familiarize yourself with materials before teaching.
9. Update and inservice. Newsletters, such as Rainbow Reflections for reading.
10. Instructional procedures to follow for using manipulatives.
11. An instructional sequence that lists additional resources and manipulatives to use with each strand to aid in pre-planning.
12. Short, concise meetings.
13. Provide instruction in alternate algorithms.
14. Very early testing of students.
15. Go slowly.
16. Don't give first graders so much at once.
17. Attend Summer Math Institute.

Question #2 on the post-survey asked which specific ideas were implemented from Math Works. 44% of the target group used at least one idea from the issue. Target members used the following ideas in their classrooms:

1. Even number cheer.

2. Presenting problem solving daily.

3. Holiday word problems.

4. Egg carton game.

5. Daily math review for accuracy.

6. All of page 6.

7. Symmetry.

8. Organizing math materials (shoeboxes on page 10).

9. Personal abacus for each child.

The writer's objective #2, which stated that over 50% of the teachers in the four target schools would use or plan to use some of the publication's ideas this year, was easily achieved. (44% used an idea and 50% responded that they plan to use an idea.) This total of 99% of the teachers easily fulfills objective #2.

Question #3 on the pre-survey asked if teachers would share ideas in a publication. 72% stated that they would, 2% replied that they would not, and 26% left the question blank. The post-survey question #3 asked if teachers sent article ideas in for the publication, Math Works, and results indicated that 17% of the target group did and 83% did not. These results are not significant because no data was submitted by the target group to indicate why 83% of them did not turn in articles, although lack of time could have been one reason.

Objective #1 stated that of the four targeted schools,

three would have article ideas published in the first issue of Math Works. This objective was achieved since three of the target schools did this. Of the 72 elementary schools in the district, articles were published from 13 different schools. This shows that 18% of the schools were represented in the mathematics publication.

Respondents completed the final words in each statement of #4 - #8 on the pre-survey and post-survey with the phrases, "Extremely helpful" - 5 points, "Very helpful" - 4 points, "Moderately helpful" - 3 points, "Slightly helpful" - 2 points, and "Not helpful" - 1 point.

The pre-survey and post-survey mean scores were calculated for individual questions and individual schools. All schools' pre-survey and post-survey mean scores were also calculated.

Questions #4 - #8 were compared with each other on the pre and post-surveys. Table 1 is an account of the increased or decreased percentages of the post-survey over the pre-survey by school for each question. (See page 28). Table 1 also shows results for the total of all four schools on each question (#4 - #8).

In school A there were 6 target group members. School B had 5 members, school C had 2 members, and school D had 5 members. A total of 18 target members was surveyed. Target members were randomly chosen by designated implementors at their schools. All were mathematics teachers.

TABLE 1

Increase of Post-Survey Percentages Over Pre-Survey Percentages

School	Question #	Mean Score by %		Difference	
		Pre	Post	Increased %	Decreased %
A	4	43	57	33	
B	4	76	84	11	
C	4	70	70	0	
D	4	36	76	111	
All Schools	4	56	72	29	
A	5	37	43	16	
B	5	84	88	5	
C	5	70	70	0	
D	5	44	44	0	
All Schools	5	59	61	3	
A	6	73	77	5	
B	6	76	76	0	
C	6	80	70		9
D	6	48	68	42	
All Schools	6	69	73	6	
A	7	87	93	7	
B	7	96	96	0	
C	7	90	90	0	
D	7	76	92	21	
All Schools	7	87	93	7	
A	8	70	67		1
B	8	88	92	5	
C	8	80	90	13	
D	8	80	92	15	
All Schools	8	80	85	6	

TABLE 2

Responses to Post-Survey Questions #9 and #10 (All Schools)

	Extremely Helpful	Very Helpful	Moderately Helpful	Slightly Helpful	Not Helpful	
Points	5	4	3	2	1	Mean
Number of Respondents to Question # 9	3	7	5	2	1	3.5
Number of Respondents to Question # 10	2	6	8	1	1	4.1

Question #4 (see Table 1), showed a 39% overall increase on the post-survey over the pre-survey for the four target schools regarding feelings about school-based inservice training. This increase could be due to the fact that the post-survey was given approximately four weeks later in the year, so more inservice meetings had transpired and therefore were helpful to teachers.

In regard to teachers' participation in mathematics meetings (question #5), there was a 7% increase in the post-survey results over the pre-survey results. This increase (even though small), could be due to the fact that more teachers were comfortable with more aspects of the program and wished to share successes they were experiencing.

A 6% increase on the post-survey was shown regarding how helpful the available information had been to teachers on question #6.

Feelings were increased by 16% on the post-survey regarding the mathematics publication (question #7) and a 5% increase was shown when teachers were asked about how they felt receiving ideas from teachers in other schools (question #8).

The target group showed an increase in positive feelings on each question #4 - #8. In assessing objective #3 which required that teachers in three out of the four target schools

would have increased knowledge in the mathematics program after reading the publication, the writer looked at the results for question #7 on the pre-surveys and post-surveys. Question #9 on the post-survey was also helpful in determining if this objective had been met.

After receiving the mathematics publication a 16% increase in feelings was shown (question #7) and question #9 indicated that the publication was somewhere between "Very" and "Moderately" helpful in solving problems with the new program. (mean = 3.5).

Objective #4 suggested that teachers in three out of the four schools would indicate the desire to see a second issue of the publication. Since teachers in all four target schools indicated that a second issue would be "Very Helpful," (with a mean score of 4.1 on question #10), this objective was also achieved. (See Table 2).

Since all four objectives were achieved, the writer concluded that the practicum was a success. The mathematics teachers in the district now had a way to share creative ideas and answers to questions about the new program, just as the reading and language arts teachers had enjoyed for ten years.

Other positive results included a phone call from a supervisor congratulating the committee, a letter from a school board member (Appendix H), and a Recognition Coupon from a teacher to the Math Works staff (Appendix I). Staff

members also received positive comments from principals and teachers regarding the Recognition Letters sent to contributors (see Appendix E). Several teachers informally congratulated Math Works staff members upon receiving the issue in their schools and pointed out the articles which would be useful for them.

CHAPTER V

RECOMMENDATIONS

"Teacher burnout" can be brought on by a lack of recognition or feeling of worth. One way of alleviating this burnout feeling, the author feels, is by providing the opportunity for teachers to share creative teaching ideas.

The writer feels that teachers are the key to helping defeat feelings of burnout in their colleagues. Bushing and Rowls (1985), stated that the current school reform movement has turned the attention of the public and the profession back to the central link in education, the teacher. Although many points of disagreement exist among the prestigious committee reports, one thing is clear: the spotlight is on the teacher. Whatever is wrong with American public schools, it cannot be fixed without the help of those teachers already in the classroom.

Guilkey-Amado (1984), stated, "In every school there are teachers who have the interest and ability to share their well-developed expertise with their peers. Too often because of time constraints and past practice, their talents were not tapped." The writer agrees that teachers helping teachers by sharing what they know works in their classrooms, will help to motivate both the givers and the receivers.

"The future of education lies not in the shifting vogues of programs, teaching methods, or curricula, but in the adaptability and competence of teachers. As humanists debate criterion-referenced tests and parents demand a return to basics, teachers struggle to deliver quality education. The teachers have the additional burden of developing professionally and personally. The stress thus placed on teachers can be debilitating, crippling not only the teacher, but ultimately the system. The challenge for the future in education is to help teachers to grow both professionally and personally, so they may cope with stress positively and avoid the downward spiral of burnout." (Matthews, Hill, and Casteel, 1985, p. 1).

Burnout is a response to stress encountered on the job. Burnout destroys people, yet educators rarely address it as a problem for the staff as a whole. Burnout is seen as an individual problem, not as a group concern. Educators are at particular risk because they are in a helping profession. According to Matthews et al. (1985), burnout affects workers in the helping professions in alarming numbers, perhaps due to the stress involved in the interpersonal relationships essential to their work. Education, a people-oriented profession, is a perfect medium for burnout to flourish unless preventive and corrective steps are taken, according to Matthews et al. (1985).

The teaching profession now ranks high among stressful occupations. In fact, according to Schnacke, Martray, and Adams (1982), the three most stressful occupations are occupied by air traffic controllers, surgeons, and teachers. This is not surprising to anyone, the author believes.

Many studies have shown the importance of workers feeling a sense of the significance of the work they do and a sense that their efforts and abilities are recognized and appreciated.

"One of the most consistent findings of the effective schools research is that effective schools have strong principals who take an active interest in instruction." (DuFour, 1985, p. 4). The author feels that principals who visit classrooms, notice neat things happening, and encourage sharing of creative teaching ideas with others, will promote motivation and excellence in the staff.

The principal at the writer's school put a personal congratulatory note on each teacher's recognition letter (Appendix E) before placing it in the teacher's mailbox. There was a general consensus from the Math Works staff that principals whose schools received the recognition letters appreciated them. It was reported that a principal called individuals in one at a time to congratulate them and present them with the letter at another school.

The 24-page issue of Math Works was well received by teachers and principals in the 72 elementary schools in the district. The publication included assistance for teachers in developing creative strategies to expand students' skills, but also was a means for improving teacher morale by recognizing teacher's ideas in print. Letters, phone calls, post-survey results, and informal dialogue with colleagues provided evidence that the publication was deemed worthwhile and should be repeated.

Based on positive post-survey results in particular, the Math Works staff decided to print a second issue this year. These plans were announced by the writer to the designated implementors at a district training meeting. They were asked to again go back to their schools to solicit ideas. The seven committee members also made personal telephone calls to the designated implementors to ask them to send just one article (or more), to represent their school in the second issue. A flyer asking for contributions was again sent out and posted in each school for teachers to read.

Response to the second issue of Math Works was phenomenal! Upon completion, the second issue was four pages longer than the first issue. This was 28 pages (eight pages beyond the number of pages desired) and many articles were not even printed because the committee was afraid they would make the

issue too long. (These extra articles were saved for printing in a third issue at a later date.)

Teachers said that they enjoyed reading about friends who were teaching in other schools. Recognition in the first issue spurred some of the same people to send in articles for the second issue. New contributors were also gained. In the second issue 21 different schools were represented. This compared to a representation of 13 schools in the first issue. A great sense of accomplishment and pride was gained by the seven members of the committee who worked on the mathematics publication. The committee has decided to continue this project next year in the district.

The project could also be continued in school settings. One designated implementor in the district decided to develop a bi-monthly mathematics newsletter to include only teachers' ideas from his school. He named it Mini-Works.

Other curricular areas could duplicate the idea. A learning disabilities teacher related to the writer that she has decided to try to produce a publication for her department similar to Math Works. Since the teachers from the learning disabilities department only get to meet two times a year, she said that the meetings become a "fantastic feast of ideas where we talk about things we are doing in our classrooms." She feels that they should be printed.

This practicum project could be replicated by other school districts. The cost of producing a mathematics publication in each district would vary depending on the number of copies needed for distribution, paper costs, and the price charged for printing.

Had it not been for the publications that the writer is currently working on and the recognition received from these, the writer could easily see herself succumbing to the symptoms of burnout. The writer is a very busy educator with many additional responsibilities being added each year. The stress is great, but the motivation comes from the recognition she receives as the creator of Math Works.

Teachers consistently have increasing work loads each year. Those whose articles are published experience the same feelings of encouragement as the writer. As the editor of the Foxfire series, Wigginton, told us, when someone says, "You've done well," we hunger to make that happen again and again.

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Sayles, L.R. & Strauss, G. (1972). Personnel: The Human Problems of Management. Englewood Cliffs, NJ: Prentice-Hall.

Schnacke, S.B., Martray,C.R., & Adams, R.D. (1982, February). Burnout: Coping with predictable professional life crises. Paper presented at the annual meeting of the Annual Association of Colleges for Teacher Education, Houston, TX. (ERIC Document Reproduction Service No. ED 257 836).

Seidman, S.A. (1985). The Relationship Between Teacher Burnout and Media Utilization. Paper presented at the Annual Convention of the Association for Educational Communications and Technology. Anaheim, CA.

Sergiovanni, T.J. & Elliott, D.L. (1975). Educational and Organizational Leadership in Elementary Schools. Englewood Cliffs, NJ: Prentice-Hall.

Wigginton, E. (Ed.). (1972). The Foxfire Book. Garden City, NY: Anchor/Doubleday.

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An Administrator's Handbook for PCMP: Pennsylvania Comprehensive Mathematics Plan. Direction for the 80's. (1982). Pennsylvania State Department of Education. Harrisburg.

This handbook for administrators of school district mathematics programs outlines a set of procedures for implementing the Pennsylvania Comprehensive Mathematics Plan (PCMP). It provides a plan to encourage the communication of related ideas and provides worksheets for teachers.

Bushing, B.A. & Rowls, M.D. (1985,February). Teacher roles in transition: Emerging professional responsibilities for teacher leaders. Paper presented at the Annual Meeting of the American Association of Colleges for Teacher Education, Denver, CO.

This paper explains attempts to integrate stronger teacher roles into guidelines for incentive plans and the use of teachers' strengths in the decision making process at local and district levels.

DeRoche, E.F. (1985). How School Administrators Solve Problems. Englewood Cliffs, NJ: Prentice - Hall.

This book explains how practicing administrators are dealing effectively with concerns such as absenteeism, poor

teacher/student morale, low academic performance, and teacher burnout.

DuFour, R.P. (1985, January). Must principals choose between teacher morale and an effective school? Paper presented at the Annual Meeting of the National Association of Secondary School Principals, New Orleans, LA.

Principals wish to foster both staff motivation and student achievement in their schools, yet research reveals a seeming contradiction between these two goals. The author discusses these goals.

Ellis, T.I. (1984). Motivating Teachers for Excellence. (Contract No. 400-83-0013). Washington, DC: National Institute of Education.

This article points out the importance of school administrators to boost teacher morale by providing participatory governance, inservice education, and systematic, supportive evaluation.

Guilkey-Amado, J. (1984, June). Improving instruction with school-site support teams. Paper presented as part of "Making our schools more effective: Proceedings of three state conferences," Vallejo, CA.

This paper describes a program at the Vallejo, California

School District involving the use of instructional support teams composed of principals and teachers from each school to promote instructional improvement by increasing school-site leadership and teamwork between administrators and teachers.

Henning, P., Blanchard, P., Syster, S., Crook, P., Ficarrotta, B., & Roper, P. (1987). Rainbow Reflections, III (2), 1-20.

Creative reading and language arts ideas are written by and for teachers in the district in this publication which is published three times each year. It has existed for ten years.

Iacocca, L. (1984). Iacocca: An Autobiography. New York: Bantam.

This book outlines a revealing personal tour of the American automobile industry. Iacocca explains how he helped to save the Chrysler Corporation. He also provides many management tips in this personal success story.

Mathematics and Young Children: Discovery Through Exploration. (1980). Kentucky State Department of Education. Division of Program Development. Frankfort, KY.

This document provides the rationale and activities for teaching mathematics concepts to young children. The implications of Piaget's findings are provided.

Matthews, D.B., Hill, H.D., & Casteel, J.M. (1985,February). Prevention of teacher burnout: The challenge of the future. Paper presented at the annual meeting of the Association of Teacher Educators, Las Vegas, NV.

Strategies that may be used by schools to prevent teacher burnout are suggested by the authors in this paper.

Sayles, L.R. & Strauss, G. (1972). Personnel: The Human Problems of Management. Englewood Cliffs, NJ: Prentice-Hall.

Theories are used in this book to analyze and solve personnel problems in business.

Schnacke, S.B., Martray, C.R., & Adams, R.D. (1982, February). Burnout: Coping with predictable professional life crises. Paper presented at the annual meeting of the Annual Association of Colleges for Teacher Education, Houston, TX.

The complex issue of teacher stress and burnout is viewed. Contributing factors are discussed and results of stress inventories are analyzed.

Seidman, S.A. (1985). The Relationship Between Teacher Burnout and Media Utilization. Paper presented at the Annual Convention of the Association for Educational Communications and Technology. Anaheim, CA.

The relationship between teacher burnout and the use of various media in teaching is examined. Data were collected for 545 elementary and secondary teachers in the Fort Worth, Texas school system.

Sergiovanni, T.J. & Elliott, D.L. (1975). Educational and Organizational Leadership in Elementary Schools. Englewood Cliffs, NJ: Prentice-Hall.

This book deals with theories as applied to administrative and supervisory concerns in elementary schools. Leadership styles are also explored.

Wigginton, E. (Ed.). (1972). The Foxfire Book. Garden City, NY: Anchor/Doubleday.

The book is a collection of articles, written by high school students in northern Georgia on "affairs of plain living." Some of the topics include log cabin building, mountain crafts and food, snake lore, moonshining, and hunting tales.

APPENDIX A

Let's recognize our colleagues for their expertise in a publication for Mathematics.

Needed: A way for Mathematics teachers to share:

1. Creative strategies for teaching Mathematics skills
2. Problems and solutions concerning The Mathematics Solution
3. Bulletin board ideas
4. Computer programs
5. Mathematics games
6. The use of volunteers
7. Other ideas, techniques, and suggestions

This is your chance to be a charter member on the staff of this publication!

Qualifications needed:

***Enjoy writing
***Artistic
***Creative
***Flexible
***Willing to work after school and evenings at home
***Prior approval of principal
***Good working knowledge of spelling, grammar, and mechanics

The committee will meet four times this year to produce two issues. The meetings will be held during school hours. Much of the actual writing, though, would need to be completed on your own time.

If interested, please complete this form and send it to Sue Syster at Mildred Helms by September 26.

Mathematics Publication

Name_____ School_____

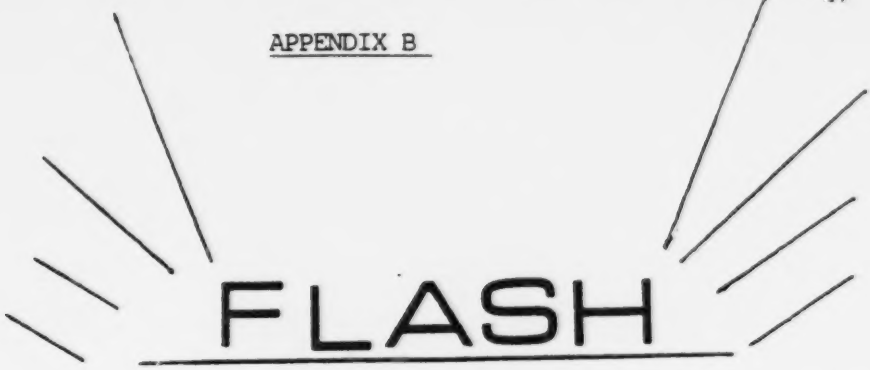
School Telephone Number _____

Please list any special talents you may have.

_____

_____

APPENDIX B



MATHEMATICS PUBLICATION

We're ready to begin. We are asking you to help us make our very first issue a great one. Please encourage teachers to submit their wonderful ideas to any of the staff members listed below. Math teachers need a way to be recognized! Let's share this expertise with each other.

Send us:

Creative strategies for teaching math skills
Questions concerning The Mathematics Solution
Bulletin Board ideas
Computer programs
Math games
The use of volunteers
Other ideas or suggestions

Articles are due for the first issue by Monday, October 27, to any staff member. We would love to see someone from your school represented!

****Designated Implementors: We would appreciate it if you could turn in articles to Sally or any staff member at your TMS meeting on October 20 or 21.*

Thanks for your help.

Mathematics Publication Staff for 1986-1987

Sue Syster, Chairman	*Mildred Helms Elementary*
Pam Roper	*San Jose Elementary*
Judy Cherry	*Kings Highway Elementary*
Mary Ann Sanchez	*Sutherland Elementary*
Len Kizner	*Melrose Elementary*
Susan Palmer	*Curtis Fundamental Elementary*
Sally McConnell, Supervisor	*Largo C & I Center*

APPENDIX C

PRE-SURVEY

Fill in the answers:

1. Are you experiencing problems in implementing the new mathematics program? Yes_____ No_____ If yes, please name them.

_____

_____

_____

2. What suggestions do you have to ensure proper implementation of the program?

_____

_____

3. Would you be willing to share (write up) teaching ideas to be published in a manual to help fellow math teachers?

_____

_____

Indicate (✓) on the scale how you would rate your feelings about the elementary mathematics program which you are implementing this year.

	Extremely Helpful	Very Helpful	Moderately Helpful	Slightly Helpful	Not Helpful
4. The school-based inservice training I have received has been....					
5. Teachers' participation in the math meetings in my school has been...					
6. Readily available information to assist me has been....					
7. A manual containing teaching strategies shared by fellow math teachers, a question and answer column, other materials used, and problems and solutions with the new program would be....					
8. The manual, if used districtwide would be....					

POST-SURVEY

Fill in the answers:

1. Are you experiencing problems or do you have unanswered questions regarding implementation of the new mathematics program? Yes_____ No_____ If yes, please name them.

_____

_____

_____

2. Which specific ideas did you implement from the publication?_____

_____

If none, do you plan to use any in the near future (this year)? Yes_____ No_____

3. Did you share (write up) teaching ideas for the mathematics publication? Yes_____ No_____ If so, were any of your ideas published? _____ How did you feel about having them published? _____

_____

Indicate (✓) on the scale how you would rate your feelings about the elementary mathematics program which you are implementing this year.

	Extremely Helpful	Very Helpful	Moderately Helpful	Slightly Helpful	Not Helpful
4. The school-based inservice training I have received has been.....					
5. Teachers' participation in the math meetings in my school has been.....					
6. Readily available information to assist me has been.....					
7. The mathematics publication (1st issue) has been.....					
8. Receiving ideas from teachers in other schools has been.....					
9. The manual has been_____in solving problems with the new math program.					
10. A 2nd issue of the math manual would be.....					

(My suggestion for another issue of the math publication would be_____
_____).

SCHOOL BOARD OF PINELLAS COUNTY, FLORIDA

Largo Curriculum & Instruction Center
205 - 4th Street SW Largo, Florida 33540
Telephone: (813) 585-9951

Albert G. Blomquist, D. Min.,
Chairman
Ron Walker,
Vice-Chairman
Gerald R. Castellanos
Betty L. Hamilton
Calvin A. Hunsinger
Frank X. Pesuth, Ed.D.
Wallace J. Voege

Scott N. Rose, Ed.D.
Superintendent

Dear

, a member of your staff, has had an article published in Math Works. We are pleased that your school is represented in this issue and look forward to more quality ideas such as this one.

The success of any publication is directly related to its quality contributions. Please be sure that the above named person receives this bookmark as a token of our appreciation.

Yours truly,

Susan Syster

Susan Syster
Math Works, Chairman

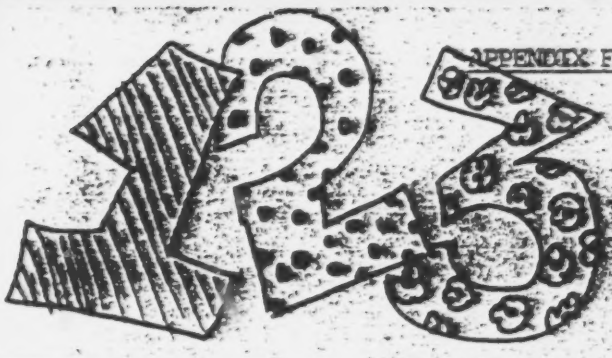
Sally McConnell (emj)

Sally McConnell, Supervisor
Elementary Mathematics

SS:SM/ams

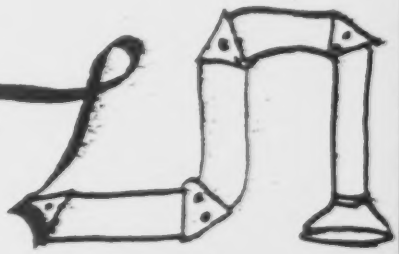
Enclosure

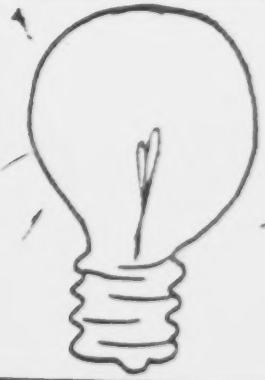
an equal opportunity institution for education and employment



You're really "sum-thing"!

Math Works





Turn on to math!

Please enjoy these bookmarks as a token of our appreciation to you for sharing your ideas with others. People like you make Pinellas County a wonderful place!

The Math Works Team

APPENDIX H

pinellas county schools **memo**

February 9, 1987

TO: Sally McConnell
Mathematics Supervisor

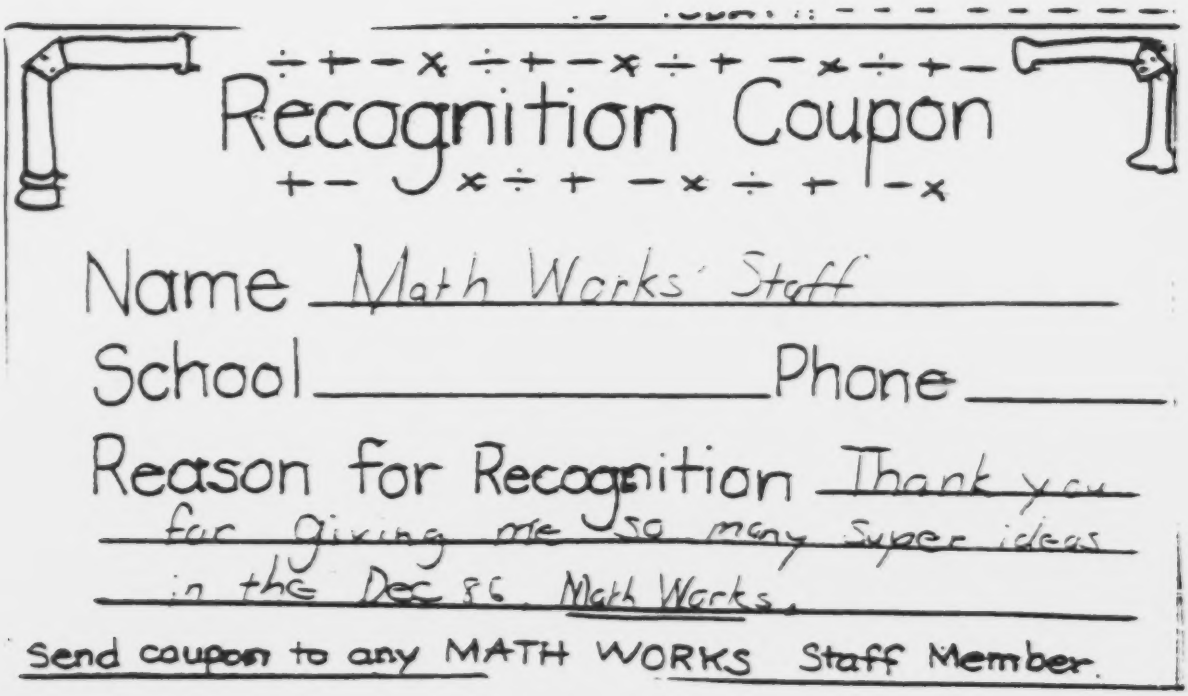
FROM: Barbara J. Crockett
Board Member

Thank you for the issues of "Math Works" your department has been forwarding to me. I enjoy reading them. It is a compliment to you and your Mathematics team that such a publication is put together.

BJC/cs

FEB 10 1987

APPENDIX I


Recognition Coupon
Name Math Works' Staff
School _____ Phone _____
Reason for Recognition Thank you for giving me so many super ideas in the Dec 86 Math Works.
Send coupon to any MATH WORKS Staff Member.